

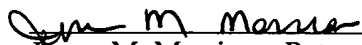
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REQUEST FOR CERTIFICATE OF
CORRECTION UNDER 37 CFR 1.322
Docket No. UF-332CXC1
Patent No. 6,919,484


Jenna M. Morrison, Patent Attorney

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : William R. Dolbier, Jr., Samia Ait-Mohand, Tatiana Sergeeva
Issued : July 19, 2005
Patent No. : 6,919,484
For : Method for Incorporation of Pentafluorosulfanyl (SF5) Substituents into Aliphatic and Aromatic Compounds

Mail Stop Certificate of Corrections Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Certificate
OCT 11 2005
of Correction

REQUEST FOR CERTIFICATE OF CORRECTION
UNDER 37 CFR 1.322 (OFFICE MISTAKE)

Sir:

A Certificate of Correction (in duplicate) for the above-identified patent has been prepared and is attached hereto.

In the left-hand column below is the column and line number where errors occurred in the patent. In the right-hand column is the page and line number in the application where the correct information appears.

Patent Reads:

Column 4, line 49:

“injection of said compounds”

Application Reads:

Amendment dated August 25, 2004, new paragraph 0014.2, line 3:

--reaction of said compounds--

OCT 17 2005

<u>Column 4, line 54:</u>	<u>Amendment dated August 25, 2004, new paragraph 0014.3, line 1:</u>
"Opiionally, the"	--Optionally, the--
<u>Column 4, lines 55:</u>	<u>Amendment dated August 25, 2004, new paragraph 0014.3, line 1:</u>
"climination"	--elimination--
<u>Column 8, line 28:</u>	<u>Amendment dated August 25, 2004, new paragraph 0020, line 3:</u>
"4,5-dichloro-1-cyclohexane(2.1 g, 0.014M)"	--4,5-dichloro-1-cyclohexene (2.1 g 0.014M)--
<u>Column 8, line 38:</u>	<u>Amendment dated August 25, 2004, new paragraph 0020, line 8:</u>
" ¹ NMR spectrum"	-- ¹ H NMR spectrum--
<u>Column 9, lines 11-12:</u>	<u>Amendment dated August 25, 2004, original claim 14 (renumbered as claim 1):</u>
"trialkylboranes, 9-borabicyclo [3, 3.1]"	--dialkylboranes, trialkylboranes, 9-borabicyclo[3.3.1]--.

A true and correct copy of the Amendment Under 37 CFR §1.111 dated August 25, 2004, which supports Applicants' assertion of the errors on the part of the Patent Office accompanies this Certificate of Correction.

Approval of the Certificate of Correction is respectfully requested.

Respectfully submitted,


Jenna M. Morrison

Patent Attorney

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Gainesville, FL 32614-2950

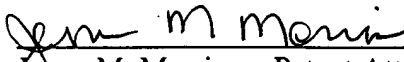
JMM/lbm

OCT 17 2005

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office on August 25, 2004.



AMENDMENT UNDER 37 CFR §1.111
Examining Group 1621
Patent Application
Docket No. UF-332CXC1
Serial No. 10/627,831


Jenna M. Morrison, Patent Attorney

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner : Jean F. Vollano
Art Unit : 1621
Applicants : William R. Dolbier, Jr., Samia Ait-Mohand, Tatiana Sergeeva
Serial No. : 10/627,831
Filed : July 24, 2003
Conf. No. : 3748
For : Method for Incorporation of Pentafluorosulfanyl (SF5) Substituents into Aliphatic and Aromatic Compounds

Mail Stop AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313

AMENDMENT UNDER 37 CFR §1.111

Sir:

In response to the Office Action dated May 25, 2004, please amend the above-identified patent application as follows:

OCT 17 2005

In the Specification

Please add the attached new paragraphs after paragraph [0014].

[0014.1] A specific embodiment of the subject invention is directed to methods of synthesis for compounds substituted with pentafluorosulfanyl. A method of the subject invention is directed to contacting a hexane solution of one or more compounds with a SF₅Cl solution. Preferably, the compounds are unsaturated. More preferably, the unsaturated compounds are substituted or unsubstituted aliphatic or alicyclic alkenes or alkynes, where the substituents may be one or more aryl or alkyl groups that themselves may bear functional groups such as alkenes, alcohols, halogens, ketones, aldehydes, carboxylic acids, carboxylic acid derivatives or other common organic functional groups.

[0014.2] The method further comprises contacting the resulting solution with one or more initiators. The initiator is selected from the group consisting of dialkylboranes, trialkylboranes, 9-borabicyclo[3.3.1] nonane, and mixtures thereof. The initiated reaction of said compounds and said SF₅Cl solution can proceed under conditions suitable for the addition of pentafluorosulfanyl substituents to the compounds. Preferably, the reaction is allowed to proceed to completion.

[0014.3] Optionally, the pentafluorosulfanyl substituted compounds can undergo elimination or oxidation, hydrolysis, drying, and/or purification. Preferably, any drying is performed over a desiccant.

[0014.4] In another embodiment, the initiator is added to a hexane solution containing SF₅Cl before the resulting solution is contacted with the one or more compounds. In yet another embodiment, the initiator is added to a hexane solution containing one or more compounds prior to the combination of the solution containing SF₅Cl and the solution containing a compound.

[0014.5] A preferred method is directed to the synthesis of a pentafluorosulfanyl aromatic, specifically a pentafluorosulfanyl benzene. A combination of 4,5-dichloro-1-cyclohexene, CH₂Cl₂, SF₅Cl, and a catalyst selected from the group consisting of dialkylboranes, trialkylboranes, 9-borabicyclo[3.3.1] nonane, and mixtures thereof is prepared. The solvent is evaporated from the

combination. The product produced thereby is contacted with a solution of sodium ethoxide (NaOEt in ethanol). Water is added to this solution, which is extracted. The extract is washed and dried over a desiccant. Solvent is evaporated from the extract, and pentafluorosulfanylbenzene is recovered.

Please substitute paragraph [0020] on page 9 of the specification with the following paragraph:

[0020] Synthesis of 1-pentafluorosulfanyl-2, 4, 5-trichloro-cyclohexane: A three-necked round bottom flask equipped with a dry ice reflux condenser and a nitrogen inlet was charged with ~~4,5-dichloro-1-cyclohexane~~ 4,5-dichloro-1-cyclohexene (2.1 g, 0.014M) and 25 mL of dry CH₂Cl₂. The mixture was cooled to -60°C and SF₅Cl (8.4g, 0.042M, 3.7 eq.) was added. One and one-half (1.5) mL of a Et₃B solution (1M solution in hexane, 0.1 eq.) was slowly added to the mixture using a syringe. Temperature was slowly increased to -30°C and the mixture was stirred at -30° to -20°C for four hours. The solvent was evaporated, furnishing an essentially pure product (4.14g, 0.013M) in a yield of about 94%. The product had the following characteristics: ¹H NMR spectrum (CDCl₃, 300 MHz): 4.7 (broad singlet, 1H, CH-SF₅), 4.4-4.15 (m, 3H, CHCl), 3-2.4 (m, 4H, CH₂); and ¹⁹F NMR spectrum (CDCl₃): 82.9 (m, 1F), 57.9 (broad d, 4F).

In the Claims

Claims 1-13 (Canceled).

Claim 14 (New): A method of making pentafluorosulfanyl substituted aliphatic or aromatic compounds comprising contacting a solution comprising a solvent, SF₅Cl in hexane, and one or more aliphatic or aromatic alkene, alkyne, cyclohexene, or cyclohexadiene compounds with an initiator selected from the group consisting of alkylboranes, dialkylboranes, trialkylboranes, 9-borabicyclo[3.3.1] nonane, and mixtures thereof to produce a reaction product comprising pentafluorosulfanyl substituted compound.

Claim 15 (New): The method according to claim 14, wherein said aliphatic or aromatic alkene, alkyne, cyclohexene, or cyclohexadiene compounds are substituted.

Claim 16 (New): The method according to claim 14, wherein said compound is cyclohexene, substituted cyclohexene, cyclohexadiene, or substituted cyclohexadiene and wherein said reaction product is a pentafluorosulfanyl substituted adduct.

Claim 17 (New): The method according to claim 16, further comprising the step of eliminating or oxidizing said pentafluorosulfanyl substituted adduct to form a pentafluorosulfanyl substituted aromatic compound.

Claim 18 (New): The method according to claim 14, further comprising the step of hydrolyzing said pentafluorosulfanyl substituted compound.

Claim 19 (New): The method according to claim 18, further comprising the step of drying said hydrolyzed pentafluorosulfanyl substituted compound.

Claim 20 (New): The method according to claim 19, wherein said drying step is performed over a desiccant.

Claim 21 (New): The method according to claim 14, further comprising the step of purifying said pentafluorosulfanyl substituted compound.

Claim 22 (New): The method according to claim 17, further comprising the step of purifying said pentafluorosulfanyl substituted aromatic compound.

Claim 23 (New): The method according to claim 18, further comprising the step of purifying said hydrolyzed pentafluorosulfanyl substituted compound.

Claim 24 (New): The method according to claim 19, further comprising the step of purifying said dried and hydrolyzed pentafluorosulfanyl substituted compound.

Claim 25 (New): The method according to claim 14, wherein said solution comprises: solvent, SF_5Cl , and initiator and wherein said solution is contacted with one or more compounds; or said solution comprises: solvent and SF_5Cl and wherein said solution is contacted with one or more compounds and said initiator.

Remarks

Claims 1-13 are pending in the subject application. By this Amendment, Applicants have canceled claims 1-13 and added new claims 14-25. Support for the new claims can be found throughout the subject specification and in the claims as originally filed and that no new matter has been introduced. Entry and consideration of the amendments presented herein is respectfully requested. Accordingly, claims 14-25 are currently before the Examiner. Favorable consideration of the pending claims is respectfully requested.

As an initial matter, Applicants wish to thank the Examiner for careful review of the claims and for identifying typographical errors. These typographical errors have been corrected in new claims 14-25.

The disclosure is objected to under 37 CFR 1.75(d)(1) as failing to provide proper antecedent basis for the claims. Applicants have amended the disclosure to set forth the matter as disclosed in original claims 1-13 (see paragraphs 14.1 through 14.5).

Additionally, paragraph 20 has been amended to correct an obvious typographical error. The starting reagents used in the methods of the subject invention are unsaturated compounds, including aliphatic or aromatic alkenes, alkynes, cyclohexenes or cyclohexadienes. Example 3 (paragraph 20) has been amended to correct the IUPAC name of the reagent to an unsaturated compound, 4,5-dichloro-1-cyclohexene. Support for this amendment is found not only throughout the specification but also in paragraph 21, where the yield of final product from the 4,5-dichloro-1-cyclohexene starting material is calculated. Applicants respectfully request entry of amended paragraph 20.

Claims 1-13 are rejected under 35 USC §112, second paragraph, as being indefinite. Claims 1-13 have been canceled rendering this aspect of the rejection moot. However, in order to expedite prosecution, Applicants submit new claims 14-25 and aver that the claims as now presented particularly point out and distinctly claim the subject matter that Applicants regard as the invention.

Claims 14-25 are directed to methods of preparing organic (aliphatic and aromatic) compounds having pentafluorosulfanyl substituents. Support for preparing organic compounds is found throughout the application and specifically in paragraphs 7-11.

One component of the solution includes one or more organic substituted or unsubstituted compounds as disclosed in paragraph 11. As known in the art, substituted compounds can include those with mono-, di-, tri- and tetra- substitutions. Applicants submit that new claims 14-25 pertain to making pentafluorosulfanyl substituted organic compounds as disclosed in the specification, for example, in paragraph 11, and that such compounds are produced by reacting aliphatic or cyclohexadiene compounds, one or more initiators, and SF₅Cl in a solution.

As used within the specification and paragraph 12, the terms “catalyst” and “initiator” are used interchangeably to describe one reaction component. As used in new claim 14, the term initiator is used to claim this element.

New claims 16 and 17 are directed to methods of producing a pentafluorosulfanyl aromatic compound. As disclosed in Example 2, when the compounds are cyclohexene, substituted cyclohexene, cyclohexadiene, or substituted cyclohexadiene, an additional elimination or oxidative step advantageously produces an aromatic compound bearing a pentafluorosulfanyl substituent. Accordingly, Applicants submit that new claims 16 and 17 are directed to the claimed invention, wherein the method produces a pentafluorosulfanyl substituted aromatic compound.

Thus, Applicants submit that the claims as now presented particularly point out the claimed invention. Accordingly, reconsideration and withdrawal of the rejection under 35 USC §112, second paragraph, is respectfully requested.

It should be understood that the amendments presented herein have been made solely to expedite prosecution of the subject application to completion and should not be construed as an indication of Applicants' agreement with or acquiescence in the Examiner's position. Applicants

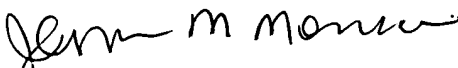
expressly reserve the right to pursue the invention(s) disclosed in the subject application, including any subject matter canceled or not pursued during prosecution of the subject application, in a related application.

In view of the foregoing remarks and amendments to the claims, Applicants believe that the currently pending claims are in condition for allowance, and such action is respectfully requested.

The Commissioner is hereby authorized to charge any fees under 37 CFR §§1.16 or 1.17 as required by this paper to Deposit Account No. 19-0065.

Applicants invite the Examiner to call the undersigned if clarification is needed on any of this response, or if the Examiner believes a telephonic interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,



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JMM/ssa

OCT 17 2005

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,919,484

Page 1 of 1

APPLICATION NO.: 10/627,831

DATED : July 19, 2005

INVENTORS : William R. Dolbier, Jr., Samia Ait-Mohand, Tatiana Sergeeva

It is certified that errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 4,

Line 49, "injection of said compounds" should read --reaction of said compounds--.

Line 54, "Opiionally, the" should read --Optionally, the--.

Line 55, "climination" should read --elimination--.

Column 8,

Line 28, "4,5-dichloro-1-cyclohexane(2.1 g, 0.014M)" should read
--4,5-dichloro-1-cyclohexene (2.1 g, 0.014M)--.

Line 38, "¹NMR spectrum" should read --"¹N MR spectrum--.

Column 9,

Lines 11-12, "irialkylboranes, 9-borabicyclo [3, 3.1]" should read
--dialkylboranes, trialkylboranes, 9-borabicyclo[3.3.1]--.

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UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

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